CLEAN WATER FOREVER

(Protecting Our Water Resources)

A Water Resource Education Unit

CONCEPT: Conservation and protection of our water resources is vital to all living things.

PURPOSE: This unit provides students with responsible actions that they can do to help conserve, care for, or protect their water resources.

OBJECTIVES: Students will be able to:

1. identify and learn ways to conserve water
2. take personal action toward protection of our water resources
3. develop positive actions they can take individually to help minimize pollution

CURRICULUM ACTIVITIES: (conducted during fieldtrip to Sandstone Falls)

1. Dilema Diplomat
2. Aquatic Habitat
3. Water Relay
4. Macroinvertebrate Mayhem
5. Recreation and Safety

New River Gorge National River

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OVERVIEW

We all live downstream

As humans, we are a significant member of our watershed and play an important role in its health and survival. What we do can have a positive or a negative effect on our water resources and watershed. Because our watershed is our home, our life-styles, activities, and actions that effect the watershed play an important role in our health and survival.

If we all do one positive thing, whether it be a life-style change or an effort to reduce, reuse and recycle, we can make a positive difference in our lives as well as in the life of the watershed in which we live.

How can I help?

Below is a review of threats to our watershed with a list of things that everyone can do to help.

Raw sewage contamination from improper treatment and disposal of human sewage from our homes, towns, and cities threatens water resources world wide including the New River watershed.

1. Install a home septic system to treat your sewage instead of running a disposal pipe straight from your sink, shower, and toilet to a nearby stream or river.
2. Construct home septic systems at least 100 feet away from a water source and outside of the floodplain. This provides a buffer zone between your septic system and the water.
3. Have your septic system checked every five years; replace the tank and lines that are leaking.
4. Be an activist to insure that your city or county government is properly funding and maintaining local waste water treatment plants to prevent untreated sewage from being dumped directly into the river or stream.
5. Conserve water; the less water used results in less water needing treatment.
6. Volunteer to help community, city or county leaders secure federal, state, or private grants needed to enlarge or upgrade older treatment plants or construct new ones.
7. Educate your neighbors and the community about the adverse affects of raw sewage and ways to prevent contamination of local streams and rivers.

Impoundments built for flood control or hydropower alter the historic flow of a waterway and cover up valuable bottomland destroying wetlands and natural communities.

1. Leave natural wetlands instead of draining and filling them for farming or development.
2. Build new homes and businesses outside of the floodplain. This will prevent flood damage to your personal property and eliminate the need for flood control dams.
3. Make a personal commitment to use less electricity; therefore, lowering the need to build additional hydropower plants and dams.
4. Work with local conservation groups to restore or maintain natural wetlands which serve as natural flood control features of a watershed.
5. Encourage your local, city, and state leaders to enact regulations and laws that limit residential and industrial development in floodplains.
6. Be an activities to get old, non-used dams and impoundments removed and restore the waterway to its natural condition.

Striping the land of vegetation for new construction, crop production, and logging accelerates soil erosion into streams, rivers and lakes harming aquatic communities.

1. Leave a 50 foot strip of natural vegetation (buffer zone) around the site being developed. This will slow runoff and trap sediments before they wash into streams, rivers, or lakes.
2. Install a silt fence made of filter fabric to trap sediment that wash from a disturbed area.
3. Seed or mulch bare areas to help stop soil erosion.
4. Hire a contractor that will maintain a natural buffer around your construction site.
5. Plant seed into unplowed fields to save time and labor costs, and reduce soil erosion.
6. Report soil erosion to agricultural and conservation agencies so that the problem can be fixed and the pollution reduced.
7. Fence livestock out of streams and ponds to reduce stream bank erosion.
8. Recycle used paper and cardboard products to reduce the amount of trees being cut through clear cutting to make new paper.
9. Lobby your government officials to regulate clear cut logging practices.
10. Require that logging operations on your land use selective cutting practices; leave a wide natural buffer next to streams and rivers; and rehab skid roads to reduce soil erosion.

Chemical fertilizers harm the aquatic environment and inhabitants when excess amounts of nutrients are washed into streams and rivers.

1. Use only when essential and in moderation; thereby, reducing the amount of nitrate that finds its way into streams, rivers, ponds, and lakes.
2. Use organic fertilizers that are just as effective as well as environmentally safe.
3. Maintain a 50 foot buffer of natural vegetation around your cropland, garden and flowerbeds to slow runoff and trap nutrients before they get to the stream, river, or lake.
4. Rotate farm and garden crops to increase soil productivity and reduce the need for chemical fertilizers.
5. Leave grass clippings on your lawn and mulch your garden with leaves. They are both “free” fertilizer and help shade the soil reducing the need for watering.

Water use in the United States is the largest world wide. Each person in the U.S. uses an average of 176 gallons of water a day for bathing, flushing the toilet, drinking, cooking, washing dishes, laundry, etc.

1. Make a personal commitment to conserve water.
2. Flush the toilet only when necessary. Liquid waste is not as dangerous as solid waste, so you do not need to flush when there is only a liquid waste in the toilet. “If it is yellow let it mellow, if it is brown flush it down.”
3. Purchase and install a toilet that uses only 1.6 gallons of water per flush.
4. Fill a half-gallon plastic jugs with sand and place it in the back of each toilet. You can save up to ten gallons of water a day.
5. Take a shorter shower, set an egg timer for eight minutes
6. Purchase and install a low flow shower head that uses only 1.5 gallons per minute.
7. Turn off the water while brushing your teeth.
8. Fill the dishwasher and washing machine full before washing a load.
9. Keep a pitcher of water for drinking in the refrigerator. By doing this, you don’t have to stand at a running faucet waiting for the water to cool.
10. Buy water-saving appliances.
11. Install aerators on faucets; they reduce water use but keep the pressure high.
12. Repair leaky faucets immediately, a leaky faucet can waste as much as 100 gallons a day.
13. Collect water dripping from your air conditioner and use it to water houseplants.

Water is often wasted in large amounts during outdoor activities at home and some businesses.

1. Water the lawn, garden, and flowerbeds in the early morning or late evening when less evaporation will occur.
2. Allow children to play with a bucket full of water and paint brushes instead of letting the hose or faucet run continuously.
3. Use a bucket when washing the car and put a nozzle on the hose.
4. Sweep your sidewalk, driveway, or parking lot instead of washing it off with a water hose.
5. Landscape with native plants that are adapted to the local rainfall and do not need to be watered during dry months.
6. Catch rainwater from the roof in barrels and use it to water the garden, flowers, and shrubs or wash the car.

Pesticides and herbicides pollute the aquatic environment when they are washed into streams and rivers.

1. Use pesticides and herbicides in moderation and apply them properly reducing the amount that finds its way into streams, rivers, ponds, and lakes.
2. Use nontoxic pesticides and herbicides that are environmentally safe.
3. Maintain a 50 foot buffer of natural vegetation around your cropland, garden and flowerbed to slow runoff and trap chemicals before they reach the stream, river, or lake.
4. Pull weeds by hand instead of using costly and harmful herbicides.
5. Apply mulch to reduce weeds and pests.

Thermal pollution from industry, power plants, and streamside clearing unnaturally heats stream water limiting its ability to absorb oxygen needed by aquatic species for survival.

1. Leave a natural buffer of trees and shrubs along streams and rivers. This will shade the water keeping it cool for fish and aquatic species and provide habitat.
2. Organize tree planting events to speed stream recovery.

Animal manure (including pets) contaminates water sources when livestock wade in streams or rainwater washes manure from feed pens, pastures and yards into streams.

1. Scoop and dispose of pet waste in a bag or put it in your toilet so rainwater does not wash it into a nearby creek or stream.
2. Fence livestock out of streams and ponds and provide a watering trough for them. This will reduce manure contamination in streams and rivers.
3. Divert rainwater runoff from feed lots and livestock pens into treatment ponds or waste-water treatment facilities so that raw manure is not washed directly into water sources.
4. Remove livestock manure from pens, feed lots, and stalls and spread it on farm fields or the garden as a source of free fertilizer.

Paints, solvents, cleaning products, and oils use in and around our homes and businesses cause water pollution when stored or disposed of improperly.

1. Recycle used motor oil, it's easy; check at your local recycling or auto service center.
2. Properly use and store household chemicals, paints and cleaners. This will help prevent or reduce the chance of them getting into our water.
3. Dispose of hazardous household products at special hazardous waste collection sites rather than with the regular garbage.
4. Use alternative cleaners like:

    a. water and baking soda mix to scour sinks, toilets, ovens and pots
    b. a little vinegar, baking soda, or potpourri in a dish to absorb odors
    c. phosphate-free soaps for doing laundry
    d. sponge-mop floors with a ½ cup vinegar in a gallon of water
    e. mix two tablespoons of olive or vegetable oil, one tablespoon of vinegar or lemon juice, and one quart of water to clean finished wood furniture.

Mining, especially abandoned mines, contributes non-point source pollution as such acid mine drainage and soil erosion to streams and rivers.

1. Report acid mine drainage to the Department of Environmental Protection.
2. Lobby your state and federal government to regulate and monitor mining practices.
3. Support efforts to reclaim mining sites that will reduce runoff and erosion.
4. Join a group to help monitor and document stream conditions.

Unlined or leaky landfills and illegal dumps allow leachates (toxic liquids) to seep into groundwater and into nearby streams and wells.

1. Be a responsible citizen and dispose of your trash and waste products properly.
2. Recycle products, like oil, paper, metal, aluminum, glass, and plastic.
3. Compost yard waste and vegetable food waste into fertilizer for gardens and flowerbeds.
4. Report to your local authority anyone seen dumping trash and waste illegally.
5. Encourage local, city and state leaders to pass regulations and laws supporting strict penalties for illegal dumping
6. Lobby government officials to establish standards for the construction and monitoring of safe landfills.
7. Call on your local and state representatives to provide funding for the enforcement of illegal dumping and for monitoring leachate contamination at landfills.

Urban runoff from streets, parking lots, sidewalks, and buildings dump a wide variety of materials from trash to toxic compounds directly into our waterways.

1. Sweep and pick up trash before it can wash into a storm drain.
2. Clean up chemical spills (oil, antifreeze, gas, etc.) no matter how small so that as little as possible is washed into a storm drain.
3. Maintain your vehicle to eliminate fluids from leaking onto roadways and parking lots.
4. Dispose of household and garden chemicals properly instead of pouring them down a storm drain or directly onto the ground.
5. Establish a storm drain monitoring program to document the extent and nature of the pollutants, identify serious threats, and detect pollution problems early.
6. Shovel your sidewalk and driveway and use sand, cat litter, or calcium chloride instead of salt. Road salt is harmful to many plants and animals.

Industry uses water in the production of many products; in the process this water is polluted and is sometimes dumped back into a stream or river untreated.

1. Buy products made from recycled materials; often less water is used to make products out of recycled materials.
2. Recycle paper; for every ton of paper recycled you can save 7,000 gallons of water that would be used in the production of new paper.
3. Be a smart consumer; buy only the products you truly use. For example, if you purchase a daily paper but don't read it everyday than buy only the edition you want to read.
4. Properly maintain your vehicle so it will run better and last longer, this will save you money on having to purchase another one sooner and will save water. It takes 1,000,000 gallons of water to produce one automobile.
5. Carpool or combine errands to save gasoline, this will save you money and save water. It takes 70 gallons of water to produce one gallon of gasoline.
6. Tell your Congresspersons and Senators that you want them to continue to support and strengthen the Clean Water Act to protect our waters from dangerous dumping by industry.

Exotic species that are intentionally and accidentally introduced into the watershed often have a devastating effort on native species because they compete for food and space.

1. Landscape with native varieties of plants instead of exotic species; they are better adapted for the climate and rainfall and need less watering.

Acid rain is a bi-product of coal burning power plants, car exhaust, and other industries that release sulfur and nitrogen oxides into the atmosphere. These pollutants mixed with moisture in the atmosphere and fall back to Earth as acid rain.

1. Drive less, take public transportation, cycle or walk, it saves gas and money and reduces air and water pollution.
2. Replace older vehicles with more fuel-efficient or alternative-fuel vehicles.
3. Keep your vehicle well-maintained to minimize pollution.
4. Make sure your home and business is well insulated against cold and heat, it saves energy and reduces the amount of air pollution created by power plants.
5. Purchase refrigerators and air conditioners with environmentally friendly coolants that if released are not as harmful to the atmosphere.
6. Plant trees and shrubs to reduce the amount of carbon dioxide and other pollutants in the atmosphere.
7. Compost leaves and brush or leave them in the woods to decompose rather than burning them. It reduces air pollution and acid rain.
8. Lobby your state and federal government to strengthen and enforce the Clean Air Act.
9. Pressure politicians to support clean industrial technologies and to legislate mandatory environmental standards
10. Be an energy conservationist, using energy wisely can reduce the amount of energy produced as well as air pollution.